

PATENT
Docket No.: HI03027USU (P02017US)

II. REMARKS

A. Status Summary

Claims 1 – 8 and 11 – 28 are pending in the present application. Claims 1 – 8 and 11 – 28 stand rejected in the present Final Office Action.

B. Claim Rejections - 35 U.S.C. § 102

Claims 1 – 8 and 11 – 28 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,930,561 (“the ‘561 Patent”). Applicant respectfully traverses the rejection because, as to each rejected claim, the ‘561 Patent fails to teach each and every element or feature recited in the claim.

Claim 1 recites an “acoustic waveguide, comprising” a “continuous three-dimensional least-energy-surface.” According to the present application, such a least-energy-surface can minimize the presence of mathematical discontinuities to optimize area expansion rate. One advantage that can result from this is the wave front remains essentially perpendicular to, and attached to, the surface of the waveguide defined by the control curves. *See, e.g.*, Specification at p. 3. Applicant’s specification also discusses the non-ideal nature of diffraction surfaces and that the invention in practice can eliminate the need for diffraction surfaces.

The ‘561 Patent does not teach “a continuous three-dimensional least-energy-surface coincident with the first control curve, the second control curve, the third control curve and the fourth control curve that intersect a circular throat end and a non-elliptical closed control surface that defines a mouth...” as recited in claim 1.

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First, as Applicant noted in its response to the February 4, 2005 Non-Final Office Action, the '561 Patent does not teach having a "least-energy-surface." The '561 Patent teaches a waveguide that is defined by a surface terminating at a mouth with a raised diffraction area, edge, or "lip," and that includes sharp corners. *See, e.g.*, the '561 Patent at Abstract ("raised lip secured around the periphery of the horn mouth"); col. 1, lines 57-58 ("raised lip secured around the periphery of the horn mouth"); col. 2, line 63 ("each corner 24 of the exponential section 20"); col. 3, lines 1-3 ("A raised dispersion lip 26 around the outer periphery of the exponential section 20 provides a sound diffraction corner for the horn mouth"; col. 3, lines 8-10 ("In order to produce a sharp corner for sound dispersion, the inner walls 28 and the top walls 30 of the dispersion lip form a 90° square corner"); and claims 1, 3, 4 & 6 ("diffraction lip"). Accordingly, the '561 Patent does not teach a least-energy-surface as required by the claims.

In the November 1, 2005 Final Office Action, the Examiner responded to Applicant's argument by stating that "Klayman teaches the radius at the midpoint of each side is 2.8 inches where as the radius as (sic) each corner is 1.7 inches which suggests that the corners of the Klayman reference are more inward relative to the sides, thus a smoothing effect at the corner." November 1, 2005 Final Office Action, pg. 3. The Examiner also stated that "the claims require the surface intersects the circular throat and non-elliptical mouth" and that "Klayman satisfies this requirement since the surface in question lies between a circular throat and raised diffracted mouth." November 1, 2005 Final Office Action, pg. 3-4.

Applicant respectfully submits that the '561 Patent teaches a horn having a "raised diffracted mouth" and therefore teaches away from an acoustic waveguide that guides sound along a "least-energy-surface." The fact that part of the horn surface may have "a smoothing

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effect” does not diminish the raised diffraction area as a teaching of the ‘561 Patent. The Examiner’s response to Applicant’s argument ignores the fact that the raised diffraction area in the ‘561 Patent horn is part of the surface that guides the sound. The surface taught in the ‘561 Patent has a raised diffraction area that cannot mathematically form a continuous surface between the throat and the mouth because a raised diffraction area by definition has intentional discontinuities. Accordingly, the ‘561 Patent fails to teach or address the problem of providing an acoustic waveguide with a least-energy-surface as recited in claim 1.

In addition, claim 1 recites “a continuous ... least-energy-surface coincident with the first control curve, the second control curve, the third control curve and the fourth control curve that intersect a circular throat end and a non-elliptical closed control surface that defines a mouth...” The ‘561 Patent does not teach a least-energy-surface that is continuous, nor that is coincident with any control curves that intersect a circular throat and a non-elliptical closed control surface. The ‘561 Patent does not teach any curves that intersect a circular throat and a non-elliptical closed control surface.

The ‘561 Patent teaches a horn that is divided into four sections: a driver receiving section (also referred to as a mating section) 12, a driver coupling section 14, an exponential section (also referred to as a sound-to-air coupling section) 20, and a raised dispersion lip 26. See ‘561 Patent, 2:9-45; 3:1-3. The driver receiver section 12 “is molded in the shape of a cone to receive the [conical] phasing plug” on the driver that is coupled to the horn. See ‘561 Patent, 2:22-26. The driver coupling section 14 has “a circular conical cross-section throughout” and extends from a small end 16 (where it is coupled to the driver receiving section 12) to a large end 18 (where it is coupled to the sound-to-air coupling section 20). See ‘561 Patent, 2:33-46. The

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sound-to-air coupling section 20 attaches to the outer end 18 of the driver coupling section 14 "to provide the remainder of the gain required in coupling sound to air." See '561 Patent, 2:44-46. The '561 Patent teaches that the horn mouth has a square cross-section, which requires that the cross-section of the exponential section 20 be square as well.

Clearly, the surface of the horn disclosed in the '561 Patent is not "continuous." The exponential section 20 has a square cross-section and is coupled to the driver coupling section 14, which is a circular conical cross-section. The '561 Patent discloses a horn divided into sections, two of which have completely different geometries.

The '561 Patent also fails to teach or suggest four "control curves that intersect a circular throat end and a non-elliptical closed control surface that defines a mouth." Applicant respectfully submits that the Examiner does not cite to any passage in the '561 Patent that discloses control curves that intersect the circular throat and the mouth.

Claims 2 – 6 depend directly or indirectly from claim 1, and therefore are distinguishable at least for the same reasons.

Independent claim 7 recites "generating a least-energy-surface that is formed from the first control curve, second control curve, third control curve and fourth control curve and intersect a circular throat end and a non-elliptical closed control curve forming a mouth," and therefore is distinguishable at least for the same reasons as regards claim 1.

Claim 8 depends from claim 7, and therefore is distinguishable at least for the same reasons.

Claim 11 depends indirectly from claim 1, and therefore is distinguishable at least for the same reasons.

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Independent claims 12 – 14 each recite “a continuous three-dimensional least-energy-surface swept about a central axis of the waveguide with minimal discontinuities and coincident with the first control curve, the second control curve, the third control curve and the fourth control curve that intersect a circular throat end and a non-elliptical closed control surface that defines a mouth,” and therefore are distinguishable at least for the same reasons as regards claim 1.

Claims 15 – 19 depend directly or indirectly from claim 12, and therefore are distinguishable at least for the same reasons. Claims 20 – 22 depend directly or indirectly from claim 13, and therefore are distinguishable at least for the same reasons. Claims 23 – 28 depend directly or indirectly from claim 14, and therefore are distinguishable at least for the same reasons.

In view of the foregoing, Applicant respectfully submits that claims 1 – 8 and 11 – 28 are patentable under 35 U.S.C. § 102(b) over the ‘561 Patent, and therefore requests that the rejection to claims 1 – 8 and 11 – 28 be withdrawn.

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III. CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

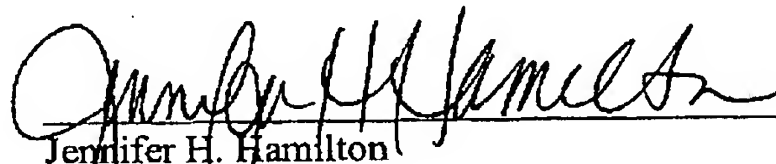
If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

Respectfully submitted,

THE ECLIPSE GROUP LLP

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By:



Jennifer H. Hamilton
Registration No. 41,814
The Eclipse Group LLP
10605 Balboa Blvd., Suite 300
Granada Hills, CA 91344
Phone: (818) 488-8141
Fax: (818) 332-4205

Customer No. 34408

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